

WHAT IS CLAIMED IS:

1. A method of producing a flowable composition that sets into a calcium phosphate containing product, said method comprising:

5 combining:

(a) a setting fluid;

(b) dry reactants comprising a calcium source and a phosphate source;

and

(c) a water-soluble contrast agent;

10 in a ratio sufficient to produce said flowable material.

2. The method according to Claim 1, wherein said setting fluid comprises said water-soluble contrast agent.

15 3. The method according to Claim 1, wherein said dry reactants comprise said water-soluble contrast agent.

4. The method according to Claim 1, wherein said water-soluble contrast agent comprises a salt of a radio-opaque element.

20

5. The method according to Claim 4, wherein said radio-opaque element has a radio-opacity that differs from calcium.

25 6. The method according to Claim 4, wherein said radio-opaque element is one that is incorporated into a calcium phosphate apatite structure of said calcium phosphate containing product.

7. The method according to Claim 4, wherein said radio-opaque element is chosen from barium, oxalate, zirconium, tantalum and tungsten.

30

8. The method according to Claim 7, wherein said radio-opaque element is barium.

9. The method according to Claim 8, wherein said salt of said radio-opaque element is barium chloride.

10. The method according to Claim 1, wherein said ratio ranges from about 0.2:1 to 0.7:1.

10 11. The method according to Claim 10, wherein said flowable composition is a paste.

12. The method according to Claim 1, wherein said setting fluid is a solution of a soluble silicate.

15 13. The method according to Claim 1, wherein said flowable composition sets into said calcium phosphate containing product in a period of time ranging from about 5 to 10 minutes.

20 14. The method according to Claim 1, wherein said calcium phosphate containing product has a compressive strength ranging from about 25 to 100 MPa.

25 15. A method of producing a paste that sets into a calcium phosphate containing product, said method comprising:

30 (a) combining:

(i) dry reactants comprising a calcium source and a phosphate source;

(ii) a setting fluid; and

(iii) a water-soluble barium salt;

wherein said dry reactants, setting fluid and water-soluble barium salt are combined in a ratio sufficient to provide for said paste; and

5 (b) mixing said combined reactants and setting fluid for a sufficient period of time to produce a paste capable of setting into a calcium phosphate containing product.

16. The method according to Claim 15, wherein said setting fluid comprises said water-soluble barium salt.

10 17. The method according to Claim 15, wherein said dry reactants comprise said water-soluble barium salt.

18. The method according to Claim 15, wherein said water-soluble barium salt is barium chloride.

15 19. The method according to Claim 15, wherein said setting fluid is a solution of a soluble silicate.

20. The method according to Claim 15, wherein both said setting fluid and dry reactants comprise said water-soluble barium salt.

21. The method according to Claim 15, wherein said flowable composition sets into said calcium phosphate containing product in a period of time ranging from about 5 to 10 minutes.

25 22. The method according to Claim 15, wherein said calcium phosphate containing product has a compressive strength ranging from about 25 to 100 MPa.

23. A flowable composition that sets into a calcium phosphate containing product, wherein said composition is produced by the method according to Claim 1.

5 24. A method of repairing a hard tissue defect, said method comprising: applying to the site of said defect a flowable composition that sets into a calcium phosphate containing product, wherein said composition is produced by the method according to Claim 1.

10 25. A kit for use in preparing a flowable composition that sets in an in vivo fluid environment into a calcium phosphate product, said kit comprising:

- (a) dry reactants comprising a calcium source and a phosphate source;
- (b) a setting fluid or components for producing the same; and
- (c) a water-soluble contrast agent.

15 26. A packaged calcium phosphate cement, said packaged cement comprising:

a tubular element separated into a first compartment and at least one additional compartment by a removable barrier;

20 (i) dry reactants comprising a source of calcium and phosphate present in said first compartment;

(ii) a setting fluid or components thereof present in said at least one additional compartment; and

(iii) a water-soluble contrast agent present in either said first compartment, said at least one additional compartment or in a second additional compartment;

25 27. The packaged calcium phosphate cement according to Claim 26, wherein said removable barrier is a clip.

30

28. The packaged calcium phosphate cement according to Claim 26, wherein said removable barrier is a frangible barrier.

29. The packaged calcium phosphate cement according to Claim 26, wherein
5 said setting fluid is a solution of a soluble silicate.